

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-11 (Canceled).

Claim 12 (Previously Presented): An adsorption heat pump which comprises (a) an adsorbate, (b) an adsorption/desorption part having an adsorbent for adsorbate adsorption/desorption, (c) a vaporization part for adsorbate vaporization which has been connected to the adsorption/desorption part, and (d) a condensation part for adsorbate condensation which has been connected to the adsorption/desorption part,

wherein

(1) the adsorbent comprises a zeolite containing aluminum and phosphorus in the framework structure, and

(2) the adsorbent is a water vapor adsorbent having a region in which the adsorption amount difference as determined with the following equation is 0.15 g/g or larger in the range in which the relative vapor pressure ϕ 2b during adsorption operation in the adsorption/desorption part is from 0.115 to 0.18 and the relative vapor pressure ϕ 1b during desorption operation in the adsorption/desorption part is from 0.1 to 0.14:

$$\text{Adsorption amount difference} = Q2 - Q1$$

wherein

$Q1$ = adsorption amount at ϕ 1b as determined from a water vapor desorption isotherm obtained at a temperature (T3) used for desorption operation in the adsorption/desorption part

$Q2$ = adsorption amount at ϕ 2b as determined from a water vapor adsorption isotherm obtained at a temperature (T4) used for adsorption operation in the adsorption/desorption part,

provided that

ϕ 1b (relative vapor pressure during desorption operation in the adsorption/desorption part) = [equilibrium water vapor pressure at the temperature of coolant (T2) cooling the condenser]/[equilibrium water vapor pressure at the temperature of heat medium (T1) heating the adsorption/desorption part]

ϕ 2b (relative vapor pressure during adsorption operation in the adsorption/desorption part) = [equilibrium vapor pressure at the temperature of cold (T0) generated in the vaporization part]/[equilibrium vapor pressure at the temperature of coolant (T2) cooling the adsorption/desorption part]

(wherein T0=5 to 10°C, T1=T3=90°C, and T2=T4=40 to 45°C).

Claim 13 (Original): The adsorption heat pump as claimed in claim 12, wherein T0 is 10°C and T2 is 40°C.

Claim 14 (Original): The adsorption heat pump as claimed in claim 12, wherein T0 is 5°C and T2 is 40°C.

Claim 15 (Original): The adsorption heat pump as claimed in claim 12, wherein T0 is 10°C and T2 is 45°C.

Claim 16 (Previously Presented): The adsorption heat pump as claimed in claim 12, wherein the adsorbent has a region in which the adsorption amount difference is 0.15 g/g or larger in the range in which ϕ 1b and ϕ 2b are from 0.115 to 0.18 and ϕ 1b is equal to or higher than ϕ 2b.

Claim 17 (Previously Presented): The adsorption heat pump as claimed in claim 12, wherein the zeolite comprises a heteroatom in the framework structure.

Claim 18 (Previously Presented): The adsorption heat pump as claimed in claim 17, wherein the proportions of aluminum, phosphorus, and the heteroatom present in the zeolite are as follows:

$$0.001 \leq x \leq 0.3$$

(x = molar proportion of the heteroatom in the framework structure to the sum of aluminum, phosphorus, and the heteroatom in the framework structure);

$$0.3 \leq y \leq 0.6$$

(y = molar proportion of aluminum in the framework structure to the sum of aluminum, phosphorus, and the heteroatom in the framework structure);

$$0.3 \leq z \leq 0.6$$

(z = molar proportion of phosphorus in the framework structure to the sum of aluminum, phosphorus, and the heteroatom in the framework structure).

Claim 19 (Previously Presented): The adsorption heat pump as claimed in claim 12, wherein the zeolite is a zeolite having a framework density of from 10.0 T/1,000 Å³ to 16.0 T/1,000 Å³.

Claims 20-40 (Canceled).

Claim 41 (Currently Amended): An air conditioning system for vehicles which employs the adsorption heat pump as claimed in claim ~~[[1]]~~ 12.

Claims 42-52 (Canceled).

Claim 53 (Previously Presented): A method for using an adsorbent which comprises heating the adsorbent having an adsorbate to desorb the adsorbate, cooling the adsorbent dried to a temperature to be used for adsorbate adsorption, and again adsorbing the adsorbate, wherein

(1) the adsorbent comprises a zeolite containing aluminum and phosphorus in the framework structure, and

(2) the adsorbent is a water vapor adsorbent having a region in which the adsorption amount difference as determined with the following equation is 0.15 g/g or larger in the range in which the relative vapor pressure ϕ 2b during adsorption operation in the adsorption/desorption part is from 0.115 to 0.18 and the relative vapor pressure ϕ 1b during desorption operation in the adsorption/desorption part is from 0.1 to 0.14:

$$\text{Adsorption amount difference} = Q2 - Q1$$

wherein

$Q1$ = adsorption amount at ϕ 1b as determined from a water vapor desorption isotherm obtained at a temperature ($T3$) used for desorption operation in the adsorption/desorption part, and

$Q2$ = adsorption amount at ϕ 2b as determined from a water vapor adsorption isotherm obtained at a temperature ($T4$) used for adsorption operation in the adsorption/desorption part,

provided that

ϕ 1b (relative vapor pressure during desorption operation in the adsorption/desorption part) = [equilibrium water vapor pressure at the temperature of coolant ($T2$) cooling the

condenser]/[equilibrium water vapor pressure at the temperature of heat medium (T1) heating the adsorption/desorption part], and

ϕ 2b (relative vapor pressure during adsorption operation in the adsorption/desorption part) = [equilibrium vapor pressure at the temperature of cold (T0) generated in the vaporization part]/[equilibrium vapor pressure at the temperature of coolant (T2) cooling the adsorption/desorption part] (wherein T0=5 to 10°C, T1=T3=90°C, and T2=T4=40 to 45°C).

Claim 54 (Previously Presented): The method for using an absorbent as claimed in claim 53, wherein T0 is 10°C and T2 is 40°C.

Claim 55 (Previously Presented): The method for using an absorbent as claimed in claim 53, wherein T0 is 5°C and T2 is 40°C.

Claim 56 (Previously Presented): The method for using an absorbent as claimed in claim 53, wherein T0 is 10°C and T2 is 45°C.

Claim 57 (Previously Presented): The method for using an absorbent as claimed in claim 53, wherein the adsorbent has a region in which the adsorption amount difference is 0.15 g/g or larger in the range in which ϕ 1b and ϕ 2b are from 0.115 to 0.18 and ϕ 1b is equal to or higher than ϕ 2b.

Claim 58 (Previously Presented): The method for using an absorbent as claimed in claim 53, wherein the zeolite comprises a heteroatom in the framework structure.

Claim 59 (Previously Presented): The method for using an absorbent as claimed in claim 58, wherein the proportions of aluminum, phosphorus, and the heteroatom present in the zeolite are as follows:

$$0.001 \leq x \leq 0.3$$

(x = molar proportion of the heteroatom in the framework structure to the sum of aluminum, phosphorus, and the heteroatom in the framework structure);

$$0.3 \leq y \leq 0.6$$

(y = molar proportion of aluminum in the framework structure to the sum of aluminum, phosphorus, and the heteroatom in the framework structure);

$$0.3 \leq z \leq 0.6$$

(z = molar proportion of phosphorus in the framework structure to the sum of aluminum, phosphorus, and the heteroatom in the framework structure).

Claim 60 (Previously Presented): The method for using an absorbent as claimed in claim 53, wherein the zeolite has a framework density of from 10.0 T/1,000 Å³ to 16.0 T/1,000 Å³.

Claims 61-65 (Canceled).

Claim 66 (Previously Presented): The adsorption heat pump of Claim 12, wherein the vaporization part cools an air stream.

Claim 67 (Previously Presented): The adsorption heat pump of Claim 12, wherein the vaporization part is a cooling source.

Claim 68 (Previously Presented): The adsorption heat pump of Claim 12, wherein the vaporization part generates cold.

Claims 69-77 (Canceled).

Claim 78 (Previously Presented): The adsorption heat pump of Claim 53, wherein the vaporization part cools an air stream.

Claim 79 (Previously Presented): The adsorption heat pump of Claim 53, wherein the vaporization part is a cooling source.

Claim 80 (Previously Presented): The adsorption heat pump of Claim 53, wherein the vaporization part generates cold.

Claims 81-108 (Canceled).